Self-leveling Rotary Laser FRE201

Art.No. R154

Service Manual

HEDÜ GmH

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1. Instrument & Accessories

Main body

Telecontrolling device

Charger

Detector & Clamp

This set of product include Main body(FRE201)、Detector(FRD100)、Clamp、Telecontrolling device、Charger(FC101)。

5# rechargeable battery and dry battery are all available for the instrument. Take out the batteries after loosing the cover screw of battery case.

1.1 Operations

1.Press the Key ON/OFF，the laser head of instrument will rotate freely to form a horizontal scanning-surface of laser beam as reference surface, and it will emit a plumb line upwards and a down point when the instrument is set upright. And also the spinning laser head will form a plumb surface and emit a horizontal line when the instrument is set horizontally.

2.According to the working requirement，spinning speed of laser head can be adjusted,

and also make laser head step-move right or left, or scan directionally. The slope of instrument can also be adjusted

3.When the instrument cooperates with detector FRD100, the height of laser beam will be decided according to indicator of the detector (When green indicator on the detector lights).

2. Structure

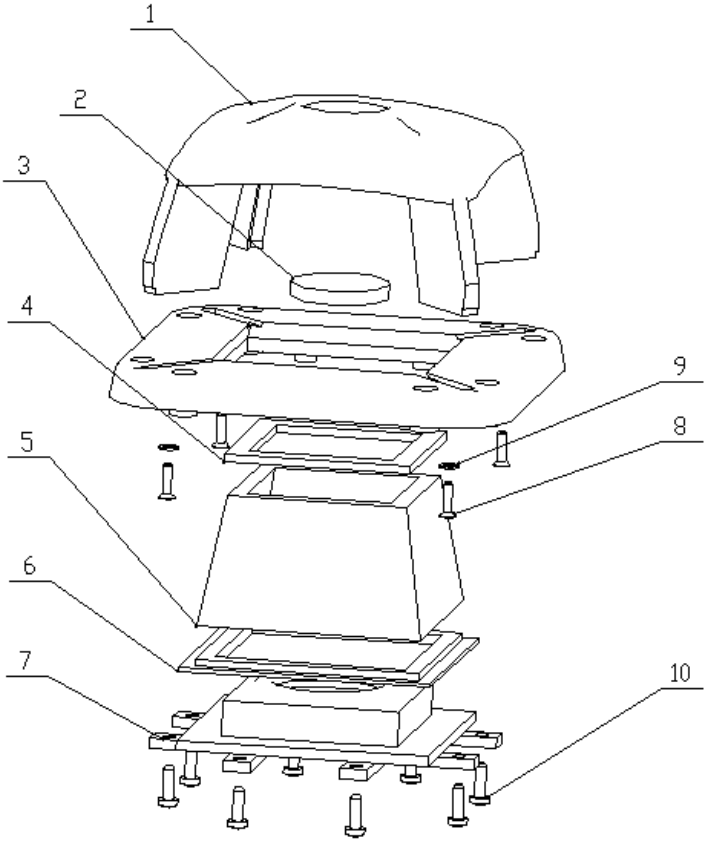
Top-cover Set

Shell Set

Underpan Set

Pendulum

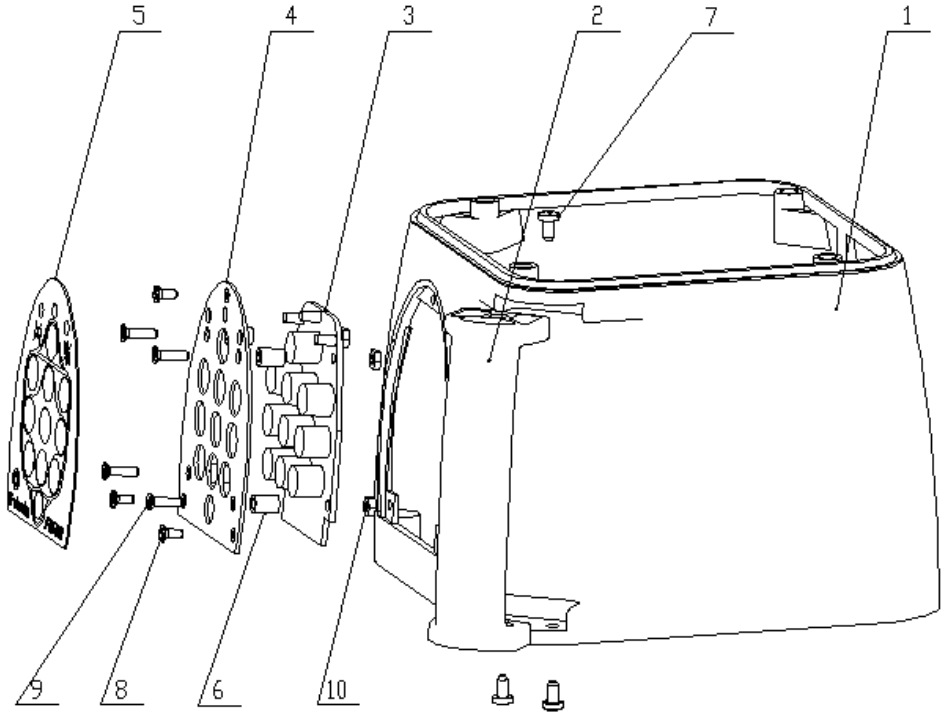
2.1 Top-cover Set



Bombing illustration

Serial number	Code	Name	Quantity
1	FRE101-201	Top-cover	1
2	FRE101-302	Shielding glass	1
3	FRE101-202	Top-cover base	1
4	FRE101-213	Gasket I	1
5	FRE101-301	Glass	4
6	FRE101-211	Gasket II	1
7	FRE101-207	Glass base	1
8	GB/T845-1985	Screw(ST2.2×9.8)	4
9	GB/T 96-1985	Φ3 Gasket	4
10	GB/T845-1985	Screw(ST2.9×9.8)	8

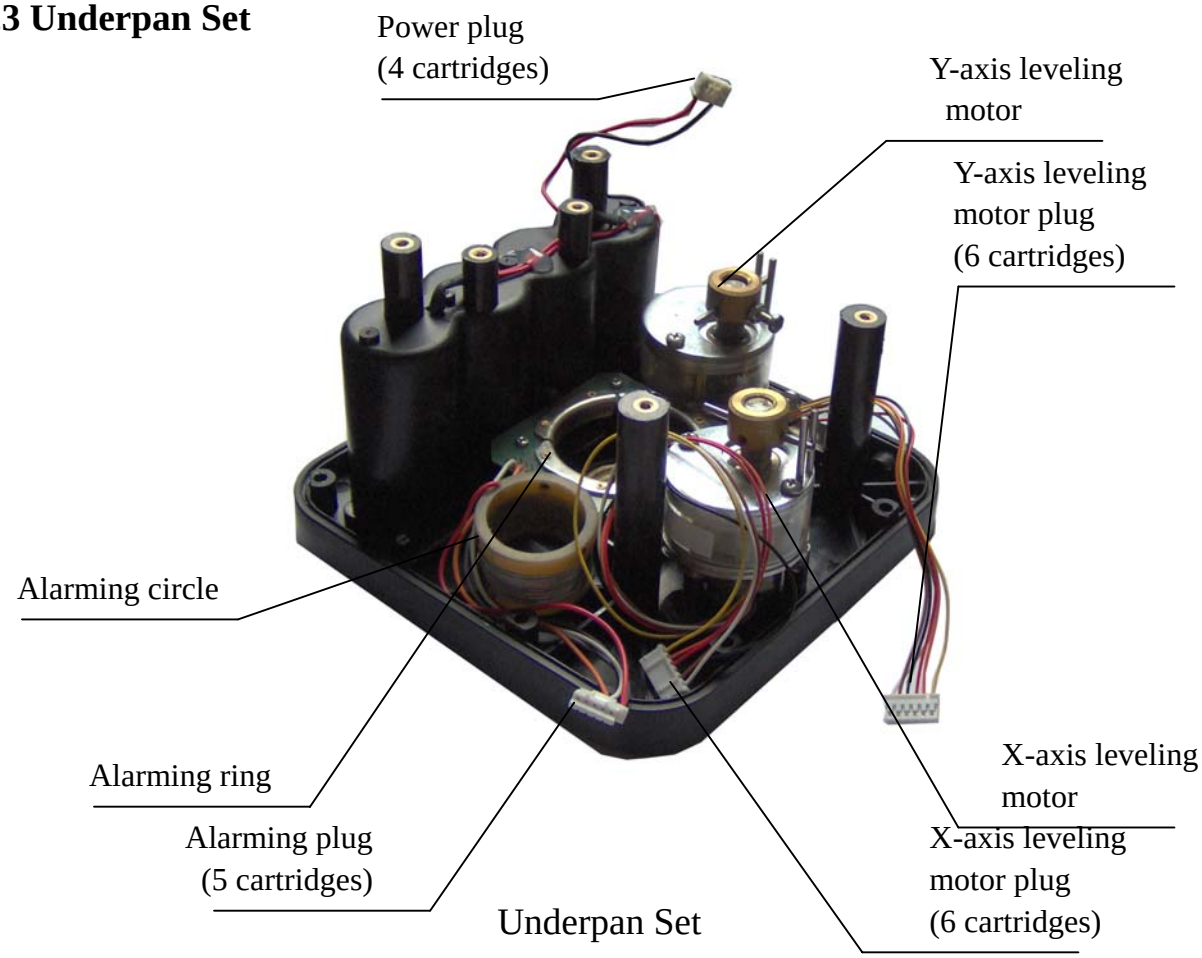
2.2 Shell Set



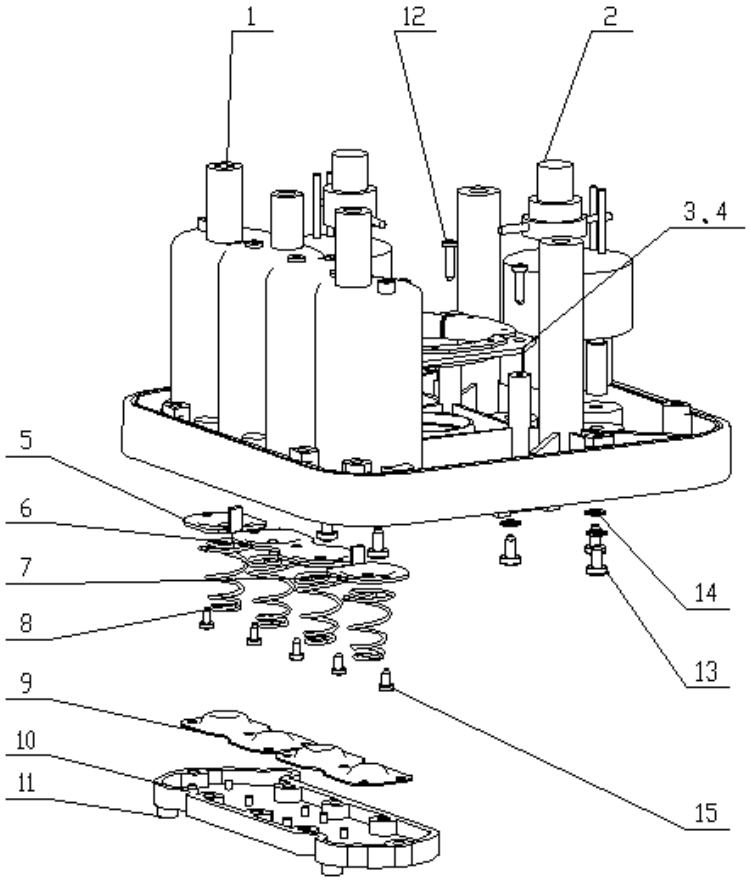
Bombing illustration

Serial number	Code	Name	Quantity
1	FRE101-203	Shell	1
2	FRE101-205	Handle	1
3		Keyboard	1
4	FRE101-127	Shielding board	1
5	FRE101-304	Keyboard sticker	1
6	FRE101-121	Gasket III	4
7	GB/T818-2000	Screw(M3×6)	3
8	GB/T819.1-2000	Screw(M2.5×6)	3
9	GB/T819.1-2000	Screw(M2.5×12)	4
10	GB/T6170-2000	Nut (M2.5)	7

2.3 Underpan Set



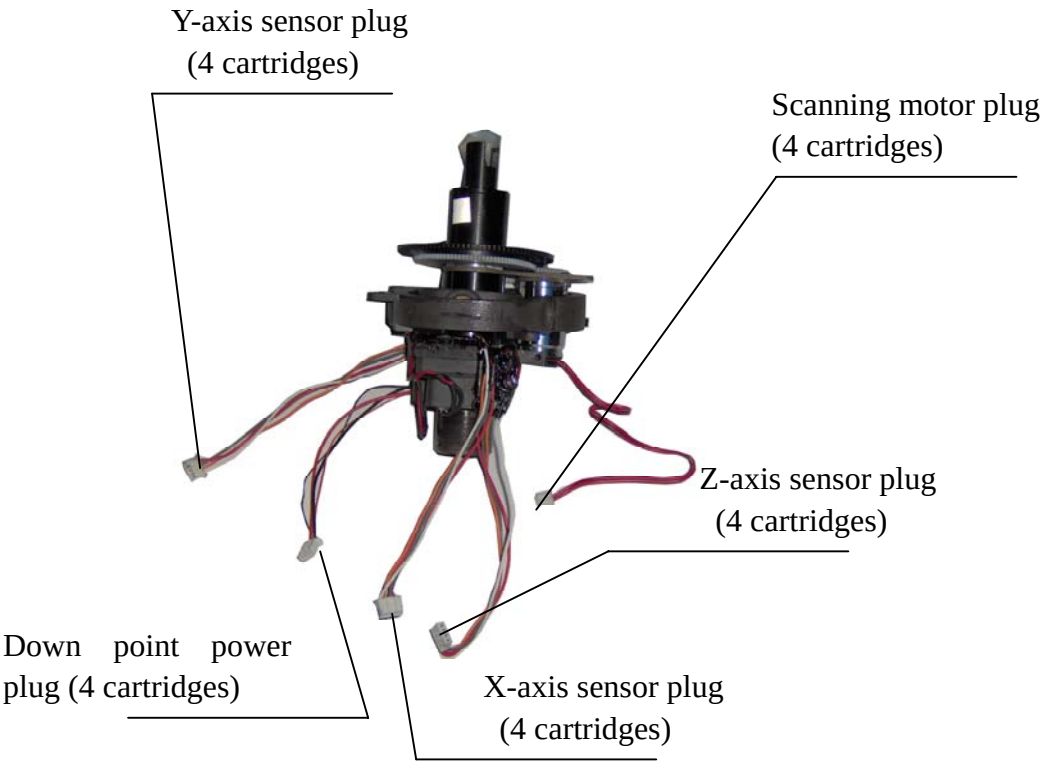
Underpan Set

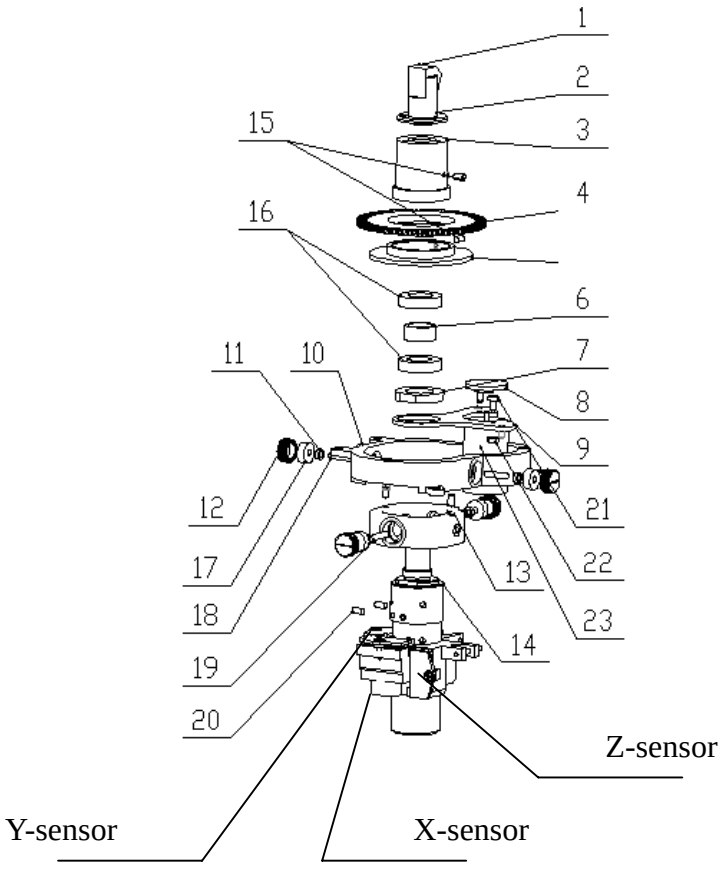


Bombing illustration

Serial number	Code	Name	Quantity
1	FRE101-204	Base	1
2	JP30-2-400	Motor set	2
3		Alarming PCB	1
4	FRE101-123	Alarming sheet	4
5	FRE101-217	Spring strip III	1
6	FRE101-214	Spring strip I	1
7	FRE101-218	Spring strip IV	1
8	FRE101-216	Spring	4
9	FRE101-215	Spring strip II	2
10	FRE101-206	Batteries cover	1
11	JP30A-026	Base foot	6
12	GB/T845-1985	Screw(M2.2×9.8)	4
13	GB/T818-2000	Screw(M3×6)	6
14		ϕ3 Gasket	6
15	GB/T845-1985	Screw(M2.2×5.5)	5

2.4 Pendulum



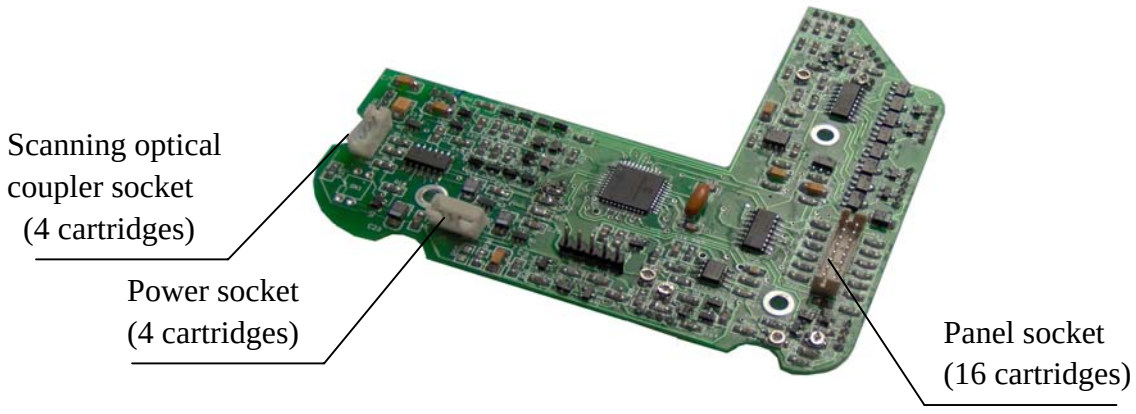


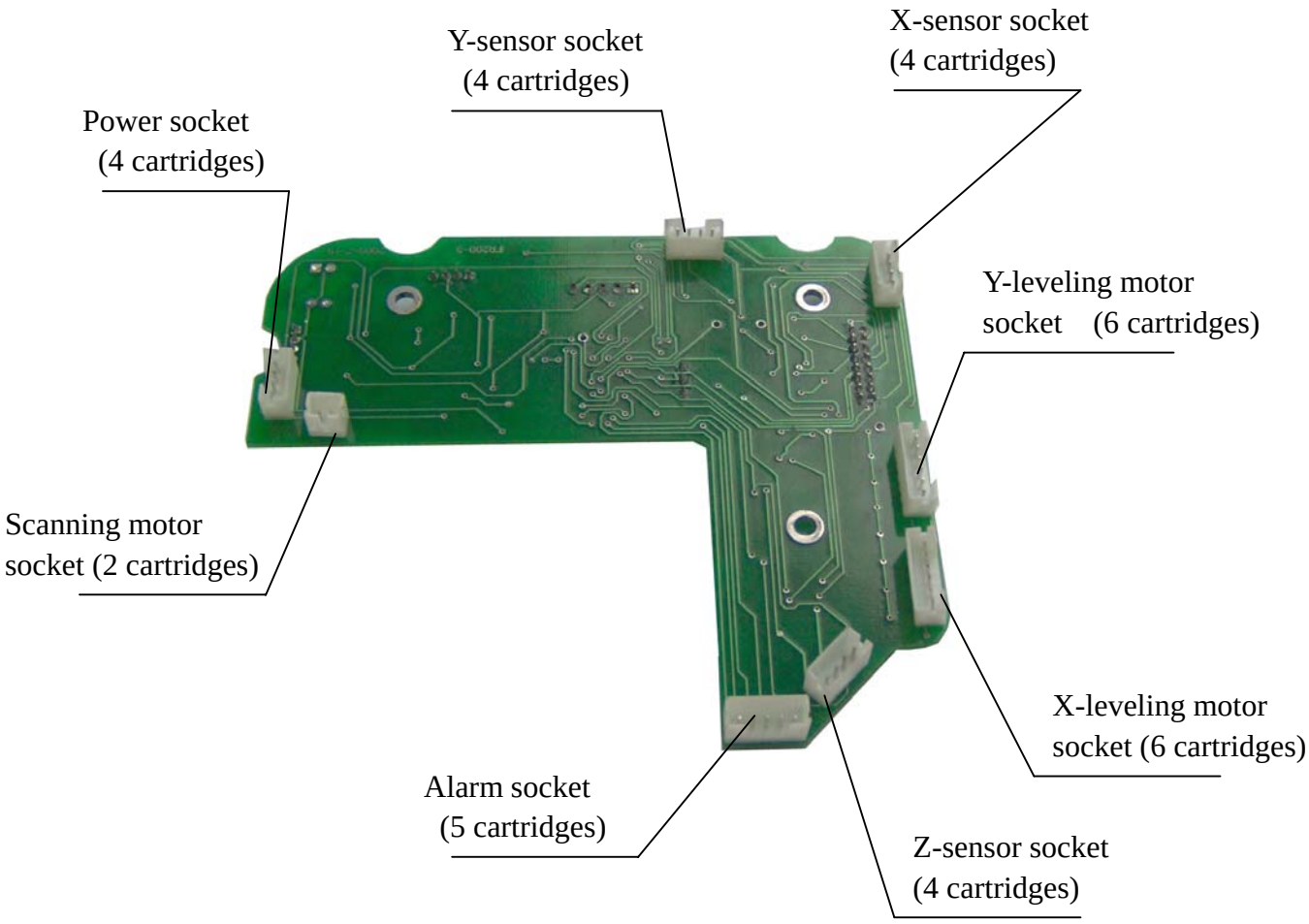
Bombing illustration

Serial number	Code	Name	Quantity
1	FRE101-307	Pentagon prism 10×10	1
2	FRE101-104	Prism base	1
3	FRE101-105	Scanning base	1
4	FRE101-112	Raster	1
5	FRE101-107	Scanning gear II	1
6	FRE101-110	Gasket I	1
7	FRE101-126	Nut II	1
8	FRE101-106	Scanning gear I	1
9	FRE101-125	Leveling board	1
10	FRE101-103	Universal ring holder	1
11	FRE101-111	Gasket II	4
12	FRE101-117	Pressing ring	4
13	FRE101-102	Universal ring	1
14	FRE101-101	Pendulum	1
15	GB/T80-2000	Stabilizing screw(M2.5×3)	2
16		Bearing (6801ZZ)	2

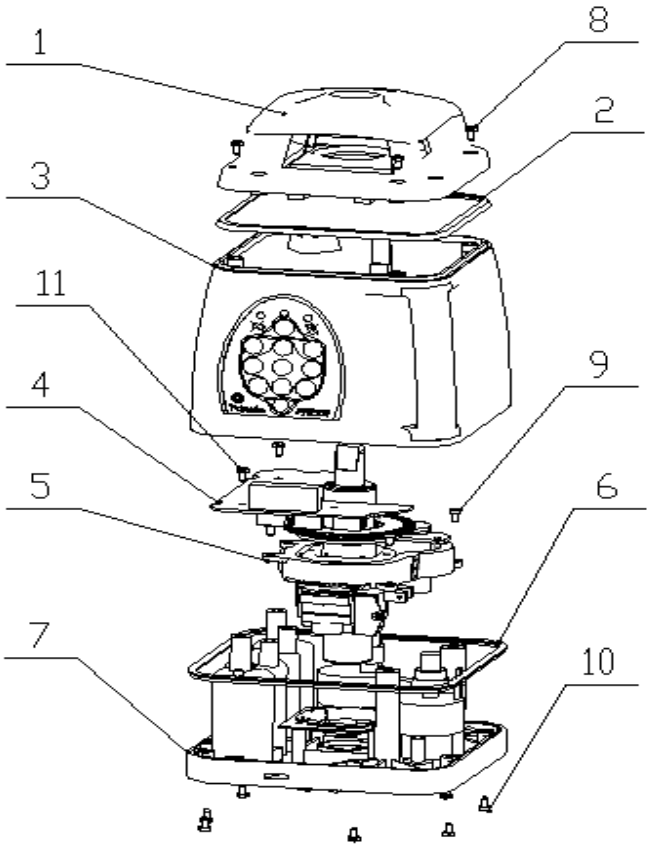
17		Bearing (623ZZ)	4
18		ϕ3×12.8 Roller pin	2
19		ϕ3×15.8 Roller pin	2
20	GB/T80-2000	Stabilizing screw(M3×4)	12
21	GB/T818-2000	Screw(M2.5×5)	2
22		Nut(M2.5)	2
23		Motor	1

2.5 PCB





2.6 Instrument Assembling

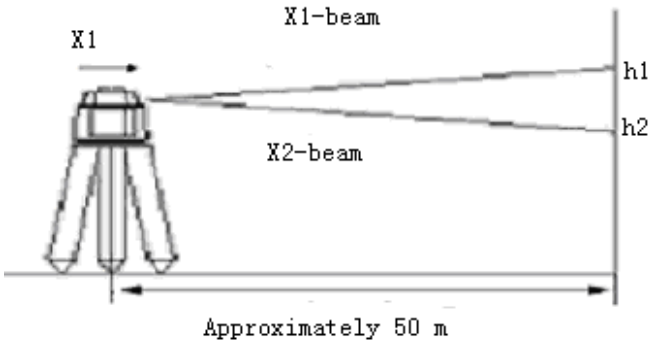


Bombing illustration

Serial number	Code	Name	Quantity
1	FRE101-1-100	Top-cover Set	1
2	FRE101-212	Gasket III	1
3	FRE101-1-200	Shell Set	1
4		PCB	1
5	FRE101-200	Pendulum	1
6	FRE101-210	Gasket I	1
7	FRE101-1-300	Underpan Set	1
8	GB/T818-2000	Screw(M3×8)	4
9	GB/T818-2000	Screw(M3×8)	4
10	GB/T818-2000	Screw(M3×8)	8
11	GB/T818-2000	Screw(M3×8)	2

3. Instrument Checking

(1) Place the instrument at the point of 50m in front of wall (or set a scaleplate at the point of 50m away from the instrument), and then adjust the level of the base approximately to aim the X1 to the wall (or scaleplate), as depicted below:



(2) After switching on the power, use the detector measuring the h1 of X1-beam on the wall or scaleplate.

(3) Loose the screw of the tripod ,and then turn around the instrument 180° to

measure the h2 of X2-beam on the wall or scaleplate.

D-value between h1 and h2 ought to be less the 10mm.

(4) Check the Y-beam in the same way.

3.1 Level adjusting

If the D-value between h1 and h2 is more than 10mm，adjust the instrument as following steps:

Old model:

(1) Press the Key ON/OFF when power indicator lights, automatic leveling of instrument starts up.

(2) Press the Key“ ⇦ ”and“ ⇨ ”simultaneously for 3 seconds when undervoltage indicator winks, the instrument enters mode of adjusting.

(3)Press the Key“ ⇦ ”or“ ⇨”of X-axis repeatedly and check the position of laser beam when undervoltage indicator is winking till the D-value between h1 and h2 is less than 10mm.

(4) Press the Key“⇧ ”or“ ⇩ ”of Y-axis repeatedly and check the position of laser beam when undervoltage indicator is winking till the D-value between h1 and h2 is less than 10mm.

(5) Press the Key “ ⇧ ” and “ ⇩” simultaneously to hold the adjustment when undervoltage indicator goes out.

New model:

I.Y-axis adjustment

(1) Press the Key ON/OFF when power indicator lights, automatic leveling of

instrument starts up.

(2) Press the Key " ⇦ " and " ⇨ " simultaneously for 3 seconds when mode indicator winks, the instrument enters mode of adjusting.

(3) Press the Key"⇧ "or" ⇩ "of Y-axis repeatedly and check the position of laser beam when mode indicator is winking till the D-value between h1 and h2 is less than 10mm.

(4) Press the Key "⇦ " and " ⇨" simultaneously to hold the adjustment when mode indicator goes out.

Note: If the instrument is set horizontally, Y-axis adjustment stands for Z-axis adjustment.

II.X-axis adjustment

(1) Press the Key ON/OFF when power indicator lights, automatic leveling of instrument starts up.

(2) Press the Key" ⇧ "and" ⇩ "simultaneously for 3 seconds when undervoltage indicator winks, the instrument enters mode of adjusting.

(3) Press the Key"⇦ "or" ⇨"of X-axis repeatedly and check the position of laser beam when undervoltage indicator is winking till the D-value between h1 and h2 is less than 10mm.

(4) Press the Key " ⇧ " and " ⇩" simultaneously to hold the adjustment when undervoltage indicator goes out.

Note: i. If canceling the adjustment, please shut off the instrument and then turn on it.

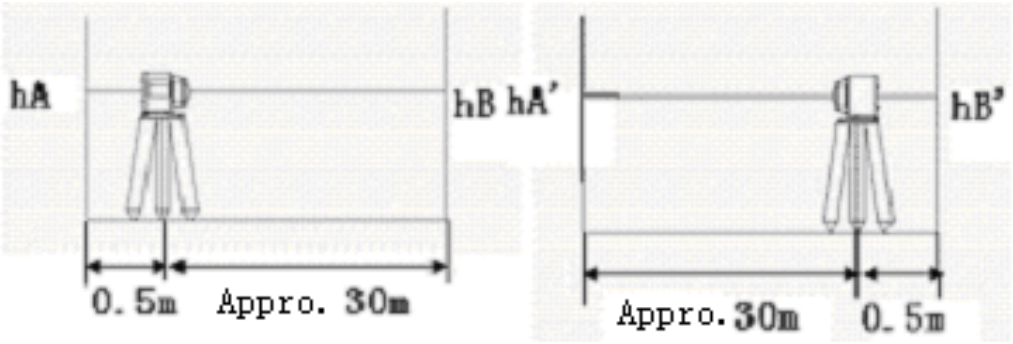
ii. If the adjusting range exceed range permitted, the power indicator will wink.

Notices：Once the D-value exceeds the error range that instrument permits, please contact the supplier to repair the instrument.

4.Horizontal-line Adjustment

4.1 Checking

(1) Place the instrument between two walls with the distance of 30m (or two scaleplates with the distance of 30m).



(2) Place the instrument according to horizontal setting manner and then adjust the instrument.

(3)Switch on the power, and then measure the middle point of the laser beam on the wall (or scaleplate): hA, hB and hA′ , hB′ .

(4) △1=hA-hA′ , △2=hB-hB′

D-value between △1 and △2 ought to be less than 6mm.

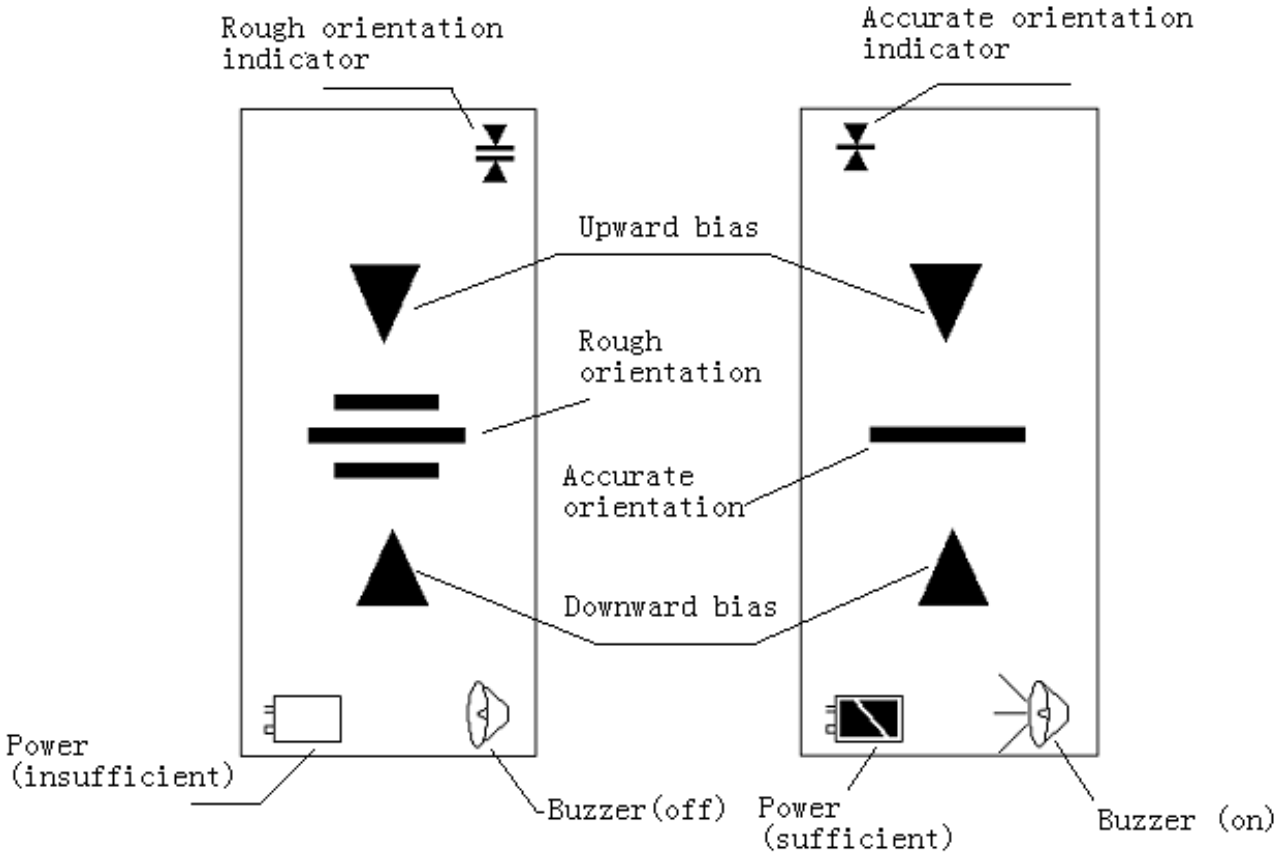
4.2 Adjusting

If D-value between Δ1and Δ2 is more than 4mm ， adjust the instrument in the same way of level adjusting. Please refer to 3. and 3.1 in details.

5. Detector

5.1 Principle

The laser beam is received by silicon photocell. After amplifying and judging the signal received, the detector will send out command signal to control the display of LCD and the buzzer.



LCD illustration

States of buzzer：upward bias alarm、downward bias alarm、accurate-orientated alarm（prolonged sound）

6.Malfunctions & Eliminations

A. Failures in starting up

(1) Symptoms：

After pressing the Key ON/OFF, power indicator can't light and also the instrument doesn't start up.

(2) Causes：

a. Poor contact of keys on the panel or panel plug.

b. Poor contact of batteries or power plug, and insufficient power，

c. Troubles of PCB.

(2) Eliminations：

a. Take off the shell，and renew the panel or connect the power plug with PCB well.

b. Take down the cover of battery case to check whether there are some dirt or rust between the spring and spring strip，and clear off them if it is true；Recharge the batteries till power is sufficient and then detach the shell to connect the power plug with PCB well.

c. Detach the shell to change the PCB.

d. Please contact the supplier when the instrument still doesn't start up after all your effort above.

B. No spinning of laser head.

(1) Symptoms：

The laser beam is being emitted but the laser head doesn’t rotate after instrument is power on.

(2) Causes：

a. Center to center distance of gear is not suitable， gearing is abnormal.

b. Troubles of scanning motor.

c. Laser head has touched the optical coupler.

d. Troubles of PCB.

(3) Eliminations：

a. Take off the shell to readjust the center-to-center distance of the gear.

b. Change the scanning motor after taking off the shell.

c. Detach the shell to readjust the space between laser head and optical coupler.

d. Change the PCB.

C. No responses of detector

(1)Symptoms：

Press the Key ON/OFF, the LCD doesn’t display.

(2)Causes：

a. Install the batteries according to the wrong electrode.

b. Panel plug drops out.

c. Troubles of PCB.

(3)Eliminations：

a. Take off the cover of battery case to install the batteries correctly.

b. Detach the panel cover of detector to insert the plug again.

c. Please take the detector back to the manufacturer to repair it, if there are some troubles in PCB.

D. No sound of buzzer.

(1)Symptoms：

There is no sound of buzzer after pressing any keys on the panel.

(2) Causes:

a. Buzzer plug drops out.

b. Troubles of PCB.

(3) Eliminations:

a. Connect the buzzer plug with the PCB well.

b. Please take the detector back to the manufacturer to repair it, if there are some troubles in PCB.